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## Two new marine Gastrotricha from the Indian Ocean coast of South Africa

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### Abstract

The study is part of a larger research programme aimed at shedding light on the gastrotrich communities of the subtropical east coast province of KwaZulu-Natal, South Africa. In previous papers, faunistic and preliminary taxonomic data on marine and freshwater gastrotrichs found in the iSimangaliso Wetland Park, were reported. Here two new interesting marine macrodasyidan species in the families Dactylopodolidae and Thaumastodermatidae are described based on observations carried out on living specimens and using differential interference contrast microscopy. The two novel species are named in honor of two great South African icons recently deceased: Nadine Gordimer and Nelson Mandela. *Dactylopodola nadine* sp. n. is the third species in the genus to bear red eye-spots; it can easily be distinguished from the closely-related red-eyed *D. baltica* and *D. roscovita* by its smaller size (Total length = 230 µm vs 275 µm vs 450 µm, respectively) and the lower number of adhesive tubes of the anterior, lateral and posterior series (on each side: 3, 4 and 4 vs 5, 6 and 8 vs 2, 9 and 12–15). *Pseudostomella mandela* sp. n. is a fairly large species (up to 481 µm in length), with a cuticular covering made up of tetrancres and relatively long caudal pedicles (up to 44 µm in length). The most evident autoapomorphic trait of the new species is the presence of 7 pairs of ‘cirrata’ tubes, two emerging in a lateral position along the pharyngeal region and five from the dorsolateral sides of the trunk. Additional relevant taxonomic characters include: 4 tubes of the anterior series, 11 tubes of the ventrolateral series and 3 tubes of the posterior series per side, 5 papillae on the dorsal margin and 6 papillae on the ventral margin of the oral palps. The high number of putative new species discovered among the South African gastrotrich fauna during our relatively short survey, highlights the relevance of this region with regard to the diversity of this group and stresses once again the importance of investigating new geographic areas in order to improve our understanding of global gastrotrich biodiversity and species richness.

**Key words:** biodiversity, Gastrotrichs, Meiofauna, KwaZulu-Natal, South Africa, taxonomy, new species

### Introduction

The Phylum Gastrotricha includes meiofaunal-sized, vermiform invertebrates found in both freshwater and marine ecosystems (e.g., Balsamo & Todaro 2002; Todaro & Hummon 2008). The group comprises about 850 species divided into the two orders, Chaetonotida and Macrodasyida (Balsamo *et al.* 2009; Hummon & Todaro 2010; Todaro 2014). The Chaetonotida includes taxa found in marine, brackish or freshwater habitats, whereas Macrodasyida generally includes species living interstitially in the sand of marine ecosystems (but see e.g., Todaro *et al.* 2012). The systematics and alpha biodiversity of the entire Phylum are in a state of flux as shown in the recent in-group taxa reassessment based on new phylogenetic data (e.g. Todaro *et al.* 2011a, 2012a, 2014; Kanneby *et al.* 2013; Guidi *et al.* 2014; Todaro *et al.* 2014) and the continual description of new species (e.g. freshwater: Kanneby 2013; Kolicka *et al.* 2013; Suzuki *et al.* 2013; Schwank & Kanneby 2014; marine: Hochberg *et al.* 2013; Kieneke *et al.* 2013; Lee *et al.* 2013; Todaro 2013; Todaro & Leasi 2013; Araujo *et al.* 2014; Atherton 2014; Gilsa *et al.* 2014; Hochberg *et al.* 2014; Kanneby *et al.* 2014; Lee & Chang 2014; Lee *et al.* 2014).

In terms of biodiversity, meiofauna and small macrobenthos are still relatively poorly known from South Africa. Although some progress has been made in recent years (e.g., Hendricks & Gibbons 2010; Todaro *et al.*

**Taxonomic affinities.** Within Thaumastodermatinae, the genera *Tetranchyroderma* and *Pseudostomella*, the number of prongs forming the peculiar scales called ancres, which composes the body cuticular armature, has been regarded as the single most useful taxonomic trait to classify species (e.g., Lee & Chang 2002; Todaro 2002; but see Todaro *et al.* 2011a). Consequently, in the genus *Pseudostomella* three basic species groups are envisaged based on the type of pronged spines i.e., species characterized by triancres (3 prongs), tetrancres (4 prongs) or pentancres (5 prongs). Based on the type of ancres, *Pseudostomella mandela* n. sp. approaches six other species all characterized by a tetrancrous covering: *P. andamanica* Rao, 1993, *P. indica* Rao, 1970, *P. koreana* Lee & Chang, 2002, *P. longifurca* Lee & Chang, 2002, *P. malayica* Renaud-Mornant, 1967 and *P. roscovita* Swedmark, 1956 (see Todaro 2012). However, based on the number of dorsal papillae (5) on the preoral palps, the new species is most similar to *P. longifurca* and *P. indica*. The number and distribution of the adhesive tubes is useful in discriminating the three taxa e.g., *P. longifurca* bears 5 TbA and 7 TbP per side and *P. indica* 2 TbA and 5 TbP, in contrast with the new species that exhibits 4 TbA and 4 TbP per side. *P. mandela* n. sp. is further distinguished as the only species in the genus that possesses cirrata tubes (7 pairs).

The finding of an additional new taxon seems to support the idea that *Pseudostomella* species appear to have a relatively restricted geographic range, at least compared to the wide distribution and cosmopolitan nature of many other gastrotrichs (cf. Todaro *et al.* 1996; Artois *et al.* 2011; Curini-Galletti *et al.* 2012; Kånneby *et al.* 2012; Kieneke *et al.* 2012).

## Conclusive remarks

Prior to our study, South Africa was ‘terra incognita’ with respect to the gastrotrich fauna; overall we have sampled only 5–6 marine localities and 3–4 freshwater ponds, all in the Province of KwaZulu-Natal, from where we have so far censused about 30 marine and 15 freshwater putative species. Of these, 4 marine and 1 freshwater species have already been described as new to science (Todaro *et al.*, 2011b, 2013 and present study) and many others appear to bear traits that would classify them as new taxa. Although estimates about the uniqueness of the South African gastrotrich fauna (at least of KwaZulu-Natal) can only be made at the end of the ongoing taxonomic investigation, the high incidence of potential new species among the fauna recorded during our relatively short survey, makes immediately manifest the relevance of this region with regard to the diversity of this group. This certainly calls for a widening of studies to other South African provinces, as the diversity of climatic, sedimentary and orographic features within this area is remarkable and is generally reflected in its rich biodiversity. In a larger framework, results of this initial investigation stress once again the importance of investigations carried out in new geographic areas for the improvement of our understanding of the overall species richness and global gastrotrich biodiversity (cf. Todaro in Appeltans *et al.* 2012; Todaro *et al.* 2014).

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